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AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listing of claims in the application.

1-43 (canceled)

44. (currently amended) An image fusing system comprising:

a camera having:

a common aperture arranged to allow target radiation to enter said camera along a common optical axis;

a beam splitter arranged to receive said target radiation passed through said common aperture and to split said target radiation into a first spectral band and a second spectral band which is different from said first spectral band;

a first sensor arranged to receive said radiation in said first spectral band and to provide a first optical output representing a first optical image of said radiation filtered into said first spectral band; and

a second sensor arranged to receive said radiation in said second spectral band and to provide a second optical output representing a second optical image of said radiation filtered into a second spectral band;

a beam combining device arranged to optically fuse said first optical output from said first sensor and said second optical output from said second sensor into a third optical output; and

a viewer for viewing said third optical output; wherein:

said first sensor and said second sensor share said common aperture ~~and are aligned along said common optical axis~~ such that parallax between said first and second sensors is substantially eliminated and said camera and said viewer are aligned along said common optical axis such that

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parallax between said camera and said viewer is substantially eliminated.

45. (currently amended) The image fusing system according to claim 44, ~~further comprising:~~wherein:

said common aperture comprises a common objective lens that is transmissive to at least a portion of said first spectral band and at least a portion of said second spectral band; and

said image fusing system further comprises:

~~a common lens as said common aperture that is transmissive to at least said first and second spectral bands,~~

a first relay lens in a first optical path between said beam splitter and said first sensor~~, wherein said common lens combines with said first relay lens~~ to correct aberrations in said first spectral band; and

a second relay lens in a second optical path between said beam splitter and said second sensor~~, wherein said common lens combines with said second relay lens~~ to correct aberrations in said second ~~spectral band.~~spectral band.

46. (currently amended) The image fusing system according to claim 45, wherein:

said first spectral band comprises the visible and/or near infrared (VIS/NIR) band of said radiation;

said second spectral band comprises the long wave infrared ~~(LIR)~~ (LWIR) band of said radiation;

said common lens passes radiation in at least a portion of said VIS/NIR band and in at least a portion of said LWIR band; ~~from said visible to said long infrared;~~

said first relay lens ~~comprises glass, wherein said first relay lens combines with said common lens to correct~~ corrects aberrations within the VIS/NIR band of about 0.4 microns to about 1.1 microns; and

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said second relay lens ~~comprises infrared material, wherein said second relay lens combines with said common lens to correct~~ corrects aberrations ~~in the LIR~~within the LWIR band of about 8 microns to about 12 microns.

47. (currently amended) The image fusing system according to claim 44, wherein:

said ~~beam splitter~~common aperture comprises a common beam splitter ~~as said common optical aperture common aperture~~ to split said radiation into a first optical path and a second optical path; and

said image fusing system further comprises:

a first objective lens in said first optical path between said beam splitter and said first sensor to filter radiation into said first spectral band ~~and to send said first spectral band of radiation to said first sensor~~; and

a second objective lens in said second optical path between said beam splitter and said second sensor to filter radiation into said second spectral band.~~and to send said second spectral band of radiation to said second sensor.~~

48. (currently amended) The image fusing system according to claim 44, wherein:

said first sensor comprises at least one of a charge coupled device or an image intensifier ~~for generating~~and generates said first optical output ~~in visible and/or near infrared~~; and

said second sensor comprises an infrared focal plane array (FPA) and a display to convert an ~~infrared~~ electronic output of said FPA to a visible image corresponding to said second optical output; ~~and~~

~~said beam combining device is arranged to optically fuse said first optical output and said second optical output for viewing.~~

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49. (currently amended) The image fusing system according to claim 48, wherein:

said first spectral band comprises a visible and/or near infrared (VIS/NIR) image of said radiation from said first sensor;

said second spectral band comprises a long wave infrared (LWIR) image of said radiation from said second sensor; and

~~said first spectral band comprises a visible and/or near infrared (VIS/NIR) image of said radiation from said first sensor;~~

~~said second spectral band comprises a long infrared (LIR) image of said radiation from said second sensor; and~~

said beam combining device comprises a narrow band filter to pass substantially all green light from said first sensor at a peak wavelength of near 0.55 ~~micron~~ micrometers with a bandwidth of near ±0.01 ~~micron,~~ micrometers, and to reflect substantially all other visible light from said display of said second ~~sensor; and to~~sensor to fuse said VIS/NIR and ~~LIR images~~LWIR images.

50. (currently amended) The image fusing system according to claim 44, wherein:

~~said first sensor includes a first electronic output and said first optical output simultaneously representing a first electronic image and said first optical image of said radiation filtered into said first spectral band;~~

said second sensor further converts said radiation in said second spectral band into a second electronic output; and ~~includes a second electronic output and said second optical output simultaneously representing a second electronic image and said second optical image of said radiation filtered into said second spectral band; and~~

~~said beam combining device is arranged to optically fuse or combine said first optical output and said second optical output into a third optical output for viewing;~~

~~further comprising:~~

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said image fusing system further comprises:

an electro-optic camera to convert said radiation in said first spectral band received by said first sensor into a first electronic output; and

a processor ~~is arranged~~ arranged to electronically fuse or combine said first electronic output and said second electronic output into a third electronic output; and

a display device arranged to selectively display at least one of said first electronic output, said second electronic output or said third electronic output.; ~~is arranged such that said first electronic output of said first sensor, said second electronic output of said second sensor, and said third electronic output from said first and second sensors may be selectively displayed; and~~

~~said beam combining device is arranged to optically fuse or combine said first optical output and said second optical output into a third optical output for viewing.~~

51. (currently amended) The image fusing system according to claim 50, further comprising:

a transmitter ~~capable of wirelessly transmitting~~ to wirelessly transmit at least one of said first, ~~second, and~~second or third electronic outputs to a remote receiver.

52. (New) An image fusing system comprising:

a camera having:

a common aperture arranged to allow target radiation to enter said camera along a common optical axis;

a beam splitter arranged to receive said target radiation passed through said common aperture and to split said target radiation into a first spectral band and a second spectral band which is different from said first spectral band;

a first sensor arranged to receive said radiation in said first spectral band and provide a first image of said radiation filtered into said first spectral band;

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a first optical output derived from said first image;

a first electronic output derived from said first image;

a second sensor arranged to receive said radiation in said second spectral band and provide a second image of said radiation filtered into said second spectral band;

a second optical output derived from said second image;

a second electronic output derived from said second image;

a beam combining device arranged to optically fuse said first optical output and said second optical output into a third optical output;

a viewer for viewing at least one of said first optical output, said second optical output or said third optical output;

a processor arranged to electronically fuse or combine said first electronic output and said second electronic output into a third electronic output; and

a display device arranged to selectively display at least one of said first electronic output, said second electronic output or said third electronic output.

wherein:

said first sensor and said second sensor share said common aperture such that parallax between said first and second sensors is substantially eliminated and said camera and said viewer are aligned along said common optical axis such that parallax between said camera and said viewer is substantially eliminated.

53. (new) The image fusing system according to claim 52, further comprising:

a transmitter to wirelessly transmit at least one of said first, second or third electronic outputs to a remote receiver.

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54. (new) The image fusing system according to claim 52, wherein:

said common aperture comprises a common lens that is transmissive to at least a portion of said first spectral band and at least a portion of said second spectral band; and

said image fusing system further comprises:

a first relay lens in a first optical path between said beam splitter and said first sensor to correct aberrations in said first spectral band; and

a second relay lens in a second optical path between said beam splitter and said second sensor to correct aberrations in said second spectral band.

55. (new) The image fusing system according to claim 52, wherein:

said first spectral band comprises the visible and/or near infrared (VIS/NIR) band of said radiation;

said second spectral band comprises the long wave infrared (LWIR) band of said radiation;

said common lens passes radiation in at least a portion of said VIS/NIR band and at least a portion of said LWIR band;

said first relay lens corrects aberrations within the VIS/NIR band of about 0.4 microns to about 1.1 microns; and

said second relay lens corrects aberrations within the LWIR band of about 8 microns to about 12 microns.

56. (new) The image fusing system according to claim 52, wherein:

said common aperture comprises a common beam splitter to split said radiation into a first optical path and a second optical path; and

said image fusing system further comprises:

a first objective lens in said first optical path between said beam splitter and said first

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sensor to filter radiation into said first spectral band; and

a second objective lens in said second optical path between said beam splitter and said second sensor to filter radiation into said second spectral.

57. (new) The image fusing system according to claim 52, further comprising:

an electro-optic camera to convert said first optical output to said first electronic output;

wherein:

said second sensor comprises an infrared focal plane array (FPA) that derives said second electronic output and a display to convert said second electronic output to said second optical output.

58. (new) The image fusing system according to claim 57, wherein:

said first spectral band comprises a visible and/or near infrared (VIS/NIR) image of said radiation from said first sensor;

said second spectral band comprises a long wave infrared (LWIR) image of said radiation from said second sensor; and

said beam combining device comprises a narrow band filter to pass substantially all green light from said first sensor at a peak wavelength of near 0.55 micrometers with a bandwidth of near ±0.01 micrometers, and to reflect substantially all other visible light from said display of said second sensor to fuse said VIS/NIR and LWIR images.

59. (new) The image fusing system according to claim 52, wherein:

said display and said viewer are arranged such that optical fusion via said third optical output and electronic fusion via said third electronic output can be viewed either simultaneously or individually.